

WHAT IS CLAIMED IS:

1. An electrolytic method for purifying an aqueous eluent stream comprising an electrolyte and suitable for use as a chromatography eluent, said electrolyte comprising selected ions of one charge, positive or negative, said eluent stream
5 including at least one contaminant ion of opposite charge to said electrolyte selected ions, said method comprising
 - (a) flowing said eluent stream through a purifying flow channel having an inlet and an outlet,
 - (b) applying an electric field through said flowing eluent stream in said
10 purifying flow channel between first and second spaced electrodes of opposite charge, said first electrode being of opposite charge to said contaminant ion, and
 - (c) removing said contaminant ion from said eluent stream in said purifying flow channel to produce a purified eluent which flows out said flow channel outlet while drawing said contaminant ion toward said first electrode.
- 15 2. The method of Claim 1 further comprising
 - (d) flowing analyte and purified eluent exiting from said purifying flow channel through chromatography separation medium having exchangeable ions of opposite charge to said electrolyte selected ions.
- 20 3. The method of Claim 1 in which flow-through ion exchange medium having exchangeable ions of opposite charge to said electrolyte selected ion is disposed in said purifying flow channel.
4. The method of Claims 1 or 3 in which said second electrode is disposed proximal to said purifying flow channel outlet.

5. The method of Claim 2 in which said first electrode is separated from said purifying flow channel by a barrier which permits the flow only of ions of the same charge as said contaminant ions.

6. The method of Claims 1 or 5 further comprising the steps of:

- 5 (e) flowing effluent from said chromatography medium through a suppressor chromatographic effluent flow channel separated by an ion exchange membrane from a suppressor regenerant flow channel, and
- (f) flowing an aqueous liquid from said regenerant flow channel past said first electrode and removing aqueous solution in contact therewith.

10 7. The method of Claim 5 in which said barrier blocks substantial bulk liquid flow.

8. The method of Claim 5 in which said barrier is disposed along the purifying flow channel in contact with the eluent stream therein.

15 9. The method of Claim 8 in which said barrier is disposed between said purifying flow channel inlet and outlet.

10. The method of Claims 1 or 5 in which said first electrode is disposed in a first electrode chamber, said method further comprising flowing an aqueous solution through said electrode chamber to remove contaminants therefrom.

20 11. The method of Claims 1 or 5 in which said first and second electrodes are disposed generally parallel to said purifying flow channel.

12. The method of Claim 1 in which said first electrode is disposed proximate to said purifying flow channel inlet and said second electrode is disposed proximal to said purifying flow channel outlet.

13. A method for purifying an aqueous eluent stream comprising an electrolyte and suitable for use as a chromatography eluent, said electrolyte comprising selected ions of one charge, positive or negative, said eluent stream including at least one contaminant ion of opposite charge to said electrolyte selected ions, said method
5 comprising

(a) flowing said eluent stream from an eluent source through flow-through ion exchange medium having exchangeable ions of opposite charge to said electrolyte selected ion in a first purifying flow channel having an inlet and an outlet,

(b) removing said contaminant ion from said eluent stream in said flow
10 channel to produce a purified eluent which flows out said flow channel outlet,

(c) discontinuing the flow of said eluent stream through first purifying flow channel,

(d) directing the eluent stream from said eluent source through flow-through ion exchange medium having exchangeable ions of opposite charge to said
15 electrolyte selected ion in a second purifying flow channel, and

(e) regenerating the ion exchange medium in said first purifying flow channel by flowing an aqueous regenerant solution therethrough.

14. A method for purifying an aqueous eluent stream comprising an electrolyte and suitable for use as a chromatography eluent, said electrolyte comprising selected
20 ions of one charge, positive or negative, said eluent stream including at least one contaminant ion of opposite charge to said electrolyte selected ions, said method comprising

(a) flowing said eluent stream through flow-through first ion exchange medium having exchangeable ions of opposite charge to said electrolyte selected ion
25 in a purifying flow channel having an inlet and an outlet,

(b) removing said contaminant ion from said eluent stream in said purifying flow channel to produce a purified eluent which flows out said purifying flow channel outlet,

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(c) flowing a first liquid sample stream analyte of opposite charge to said electrolyte selected ions and purified eluent from said purifying flow channel through chromatography separation medium having exchangeable ions of opposite charge to said electrolyte selected ions, and

5 (d) after completion of step (c), and before flow of a second liquid sample stream through said chromatography separation medium, regenerating said ion exchange medium in said purifying flow channel by flowing an aqueous regenerant liquid stream through said purifying flow channel.

15 16. The method of Claims 1, 13 or 14 in which said contaminant ion is carbonate or bicarbonate ion.

16. Chromatography apparatus comprising:

(a) at least one contaminant-purifying housing defining at least one purifying flow channel having an inlet an outlet,

15 (b) a source of chromatography liquid eluent comprising an electrolyte comprising selected ions of one charge, positive or negative, in liquid communication with said purifying flow channel inlet,

(c) spaced first and second electrodes of opposite charge disposed to apply an electric field through said one purifying flow channel, and

20 (d) chromatographic separation medium having an inlet and an outlet, with exchangeable ions of opposite charge to said electrolyte selected ions, said separation medium inlet being in liquid communication with said one purifying flow channel outlet.

17. The chromatography apparatus of Claim 16 further comprising:

25 (e) a detector in liquid communication with said separation medium outlet.

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18. The chromatography apparatus of Claim 16 further comprising:
(e) a barrier permitting the flow of ions only of one charge.
19. The chromatography apparatus of Claim 18 in which said barrier blocks bulk liquid flow.
- 5 20. The chromatography apparatus of Claims 18 or 19 in which said barrier is disposed along said one purifying flow channel in contact therewith.
21. The chromatography apparatus of Claim 20 in which said barrier is disposed between said purifying flow channel inlet and outlet.
22. The chromatography apparatus of Claim 16 further comprising:
10 (e) flow-through ion exchange medium, having exchangeable ions of opposite charge to said electrolyte selected ion, disposed in said one purifying flow channel.
23. The chromatography apparatus of Claim 16 in which said second electrode is disposed proximal to said one purifying channel outlet.
- 15 24. The chromatography apparatus of Claim 16 in which said first electrode is disposed proximal to said one purifying channel inlet.
25. The chromatography apparatus of Claim 16 further comprising a first electrode chamber, wherein said first electrode is disposed in said first electrode chamber.
- 20 26. The chromatography apparatus of Claim 16 further comprising:
(e) a suppressor having a chromatographic effluent flow channel in fluid communication with said chromatographic separation medium and separated by an

ion exchange membrane which permits passage of one charge only from a suppressor regenerant flow channel in fluid communication with said first electrode.

27. Chromatography apparatus comprising:

- 5 (a) a source of chromatography liquid eluent comprising an electrolyte comprising selected ions of one charge, positive or negative,
- (b) at least one contaminant-purifying housing defining at least one purifying flow channel,
- 10 (c) first flow-through ion exchange medium, having exchangeable ions of opposite charge to said electrolyte selected ions disposed in said one purifying flow channel,
- (d) chromatographic separation medium having an inlet and an outlet, with exchangeable ions of opposite charge to said electrolyte selected ions, said separation medium inlet being in liquid communication with said one purifying flow channel,
- 15 (e) a source of regenerant solution, and
- (f) valving including at least a first and second position, permitting, in said first position, flow from said one purifying flow channel to said chromatographic separation medium but blocking flow from said regenerant source to said one purifying flow channel and permitting, in said second position, flow from
20 said regenerant solution source to said one purifying flow channel but blocking flow from said one purifying flow channel to said chromatographic separator.

28. The chromatography apparatus of Claim 27 further comprising:

- (g) a second contaminant-purifying housing defining a second purifying flow channel, and
- 25 (h) second flow-through ion exchange medium disposed in said second purifying flow channel, said valving in said first position also permitting liquid flow between said regenerant solution reservoir and said second purifying flow channel

and, in said second position, between said second purifying liquid flow channel and said chromatography separation medium.

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